

Cluster Formation and Ion Chemistry in the High Pressure Inlet of a Chemical Ionization Mass Spectrometer: Lessons learned from Field and Laboratory Studies

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We present data on analyte-reagent and reagent-reagent clusters of acetate anion in a high pressure inlet chemical ionization high-resolution time-of-flight mass spectrometer (HRTof-CIMS). We will focus on the ion-molecule reaction dynamics to allow selective measurement of organic acids. Variation of pressures and electric fields in the ion-molecule and cluster dissociation region allowed us to understand reagent ion cluster formation, dynamics and sensitivity of the instrument towards specific compounds. In addition, influence of secondary chemistry after proton transfer to the reagent ion on sensitivity is also explored. Finally, recent field measurements of gas- and particle-phase organic acids in a ponderosa pine forest will be presented.

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